Received November 12, 1772.

XIX. *Experiments upon the different Kinds of Marle found in* Staffordſhire, *by*
by Charles Morton, *M. D. Sec. R. S*

Read Feb. 4, 1773.

Number.	Deſcription.	Quantity of calcarious earth in half a dram, as ſeparated by the nitrous acid, and precipitated by mild fixed alkaly.	What was left after the foregoing ſ no longer acted upon by the nit being	
		Grains.	Mixed with water, became	Wh
1.	Red and blue intermixed, in ſmall friable lumps.	1	Uniform and plaſtic.	A hard rec
2.	Red, in ſmall friable lumps.	0¾	Uniform and plaſtic.	A hard rec
3.	Grey, in large hard lumps.	5	Plaſtic, but a little gritty.	A ſoft yell
4.	Red, hard, compact.	3	Uniform and plaſtic.	A hard red
5.	Red, with grey ſpots, in large hard lumps, ſcarcely to be broken with a hammer.	8½	Plaſtic.	A ſoft pale
6.	Light grey, like a grit ſtone.	8	Gritty, no union.	No union.
7.	Brown, friable, in large lumps.	18	No union.	A little co
8.	Red, in large friable lumps.	14	Plaſtic, but a little gritty.	A ſoft red
9.	Browniſh white, very hard, like calcarious incruſtations.	16	No union, gritty.	No union.
10.	Lead colour, friable, flaky.	14½	No union, gritty.	No union.
11.	Brown grey, very hard, in irregular lumps.	16	No union, gritty.	No union.
12.	Lead colour, in powder and in ſmall hard lumps.	20½	Uniform and plaſtic.	A ſoft whi

Half a dram of the marles being put into ſimilar glaſs cups, two drams of nitrous acid being added to each glaſs, they all effervesce
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cipitated powders being mixed together, 82 grains thereof put into a crucible, and calcined with a ſtrong heat, loſt 35 grains in weight.
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part of clay is burnt to quick lime. All the above marles crack and fall to pieces, when expoſed to the weather.

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, *by* William Withering, *M. D.* *Communicated*
R. S.

oregoing ſeparation, was by the nitrous acid ; but	One dram of each of the marles being calcined, weighed			The calcined marles put into water, produced
When burnt	Grains.	Loſt grains.	Burnt to	
A hard red brick.	52	8	Red brick.	No effect.
A hard red brick.	53	7	Red brick.	No effect.
A ſoft yellowiſh brick.	49	11	Soft yellow brick.	Weak lime water.
A hard red brick.	50	10	Red brick.	No effect.
A ſoft pale red brick.	48	12	Hard grey ſtone.	Lime water.
No union.	51	9	Soft and ſtony.	Lime water.
A little coheſion.	46	14	Soft ſtone.	Lime water.
A ſoft red brick.	48	12	Soft ſtone.	Strong lime water.
No union.	43	17	Soft ſtone.	Strong lime water.
No union.	48	12	Soft ſtone.	Strong lime water.
No union.	40	20	Soft ſtone.	Strong lime water.
A ſoft whitiſh brick.	29	31	Powdery.	Strong lime water.

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		Grains.	Mixed with water, became	When burnt	Grains.	Loſt grains.	Burnt to	
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3.	Grey, in large hard lumps.	5	Plaſtic, but a little gritty.	A ſoft yellowiſh brick.	49	11	Soft yellow brick.	Weak lime water.
4.	Red, hard, compact.	3	Uniform and plaſtic.	A hard red brick.	50	10	Red brick.	No effect.
5.	Red, with grey ſpots, in large hard lumps, ſcarcely to be broken with a hammer.	8½	Plaſtic.	A ſoft pale red brick.	48	12	Hard grey ſtone.	Lime water.
6.	Light grey, like a grit ſtone.	8	Gritty, no union.	No union.	51	9	Soft and ſtony.	Lime water.
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The foregoing experiments were undertaken with a view to aſcertain how far it would be adviſeable to attempt burning the marles of this country into quicklime, for the purpoſes of agriculture; they may likewiſe furniſh us with ſome uſeful hints relative to the kind of marles proper to be uſed upon different kinds of lands. Perhaps the calcarious earth united with clay, as in N° 1, 2, 4, &c. may be the beſt for light ſandy ſoil; and N° 6, 9, 10, 11, where the calcarious earth is united with ſand, the moſt eligible where the land is already ſtiff, and abounding with clay. How far the different quantities of fixable air, or other volatile parts, contained in each of the marles, as ſhewn by column the fifth, will influence their preference in agriculture, muſt be left to the experience of the farmer to determine.